UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/523,446	03/10/2000	Qiming Chen	10991148-1	5325

22879	7590	11/19/2003	

HEWLETT PACKARD COMPANY
P O BOX 272400, 3404 E. HARMONY ROAD
INTELLECTUAL PROPERTY ADMINISTRATION
FORT COLLINS, CO 80527-2400

EXAMINER
WU, YICUN

ART UNIT	PAPER NUMBER
2175	12

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
	09/523,446	CHEN ET AL.
Office Action Summary	Examiner	Art Unit
	Yicun Wu	2175

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed
  after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any
  earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 August 2003*.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is
closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *2-18,20,22-25 and 27-30* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *4-6,14,16-18,20,22-25,27 and 28* is/are rejected.

7)☒ Claim(s) *2-3, 7-13, 15 and 29-30* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage
application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

13)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application)
since a specific reference was included in the first sentence of the specification or in an Application Data Sheet.
37 CFR 1.78.

    a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific
reference was included in the first sentence of the specification or in an Application Data Sheet. (37 CFR 1.78)

DOV POPOVIC
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____.

4)☐ Interview Summary (PTO-413) Paper No(s). _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

III. DETAILED ACTION

REOPENING of PROSECUTION

1. In view of the appeal brief filed on August-21-2003,

PROSECUTION IS HEREBY REOPENED. New grounds of rejection are-

set forth below.

To avoid abandonment of the application, appellant must

exercise one of the following two options:

(1) file a reply under 37 CFR 1.111 (if this Office action

is non-final) or a reply under 37 CFR 1.113 (if this Office

action is final); or,

(2) request reinstatement of the appeal.

If reinstatement of the appeal is requested, such request

must be accompanied by a supplemental appeal brief, but no new

amendments, affidavits (37 CFR 1.130, 1.131 or 1.132) or other

evidence are permitted. See 37 CFR 1.193(b)(2).

Claim Rejections - 35 USC § 103

2.   The following is a quotation of 35 U.S.C. 103(a) which

forms the basis for all obviousness rejections set forth in this

Office action:

> A patent may not be obtained though the invention is not identically
> disclosed or described as set forth in section 102 of this title, if
> the differences between the subject matter sought to be patented and
> the prior art are such that the subject matter as a whole would have
> been obvious at the time the invention was made to a person having
> ordinary skill in the art to which the subject matter pertains.
> Patentability shall not be negatived by the manner in which the
> invention was made.

3.   Claims 4-5, 14, 16-18, 20, 22-25 and 27-28, are rejected

under 35 U.S.C. 103(a) as being unpatentable over Tuzhilin (U.S.

Patent No. 6,236,978 B1) in view of Jiawei Han, ("Towards On-

Line Analytical Mining in Large Databases," ACM SIGMOD Record,

27:1, pp. 97-107, 1998 and Han hereinafter).

As to Claims 27, 14 and 28, Tuzhilin teaches a method for

detecting telecommunication fraud(i.e. fraud detection systems

Tuzhilin Col. 14, lines 30-32) performed in a data processing

system having a data warehouse and an OLAP server, the method

comprising:

retrieving a plurality records from data warehouse (i.e.

user transaction collection and recording unit) (Tuzhilin Fig.

6a);

generating a calling profile cube (i.e. m-dimensional space
Tuzhilin Col. 7, lines 60-67) based on the call records; wherein
the calling profile cube includes information on multiple
customers (Tuzhilin Col. 3, lines 40-41, and Col. 5, line 4-20
and Fig. 1-3);

generating a volume-based calling pattern cube for each
individual customer based on the multi customer calling profile
cube (Tuzhilin Col. 3, lines 40-41 and Fig. 1-3);

comparing the volume-based calling pattern cube for each
customer to a predetermined fraudulent volume-based calling
pattern (Tuzhilin Col. 11, line 65) and (Tuzhilin Col. 3, lines
40-41 and Fig. 1-3); and

when the volume-based calling pattern cube is in a first
predetermined relationship with predetermined fraudulent volume-
based calling pattern, performing a first action (Tuzhilin Col.
12, lines 1-3) and (Tuzhilin Col. 11, lines 65) and (Tuzhilin
Col. 3, lines 40-41 and Fig. 1-3).

Tuzhilin does not explicitly teach OLAP.

Han teaches OLAP (Han Fig. 1 and page 3, section 2.2-2.3
and page 4, section 2.4, page 5 section 2.5, page 6 section
2.6).

Therefore, it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Tuzhilin to include: OLAP.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified Han by the teaching of Tuzhilin to include: OLAP with the motivation to greatly enhance the power and flexibility of exploratory data mining as taught by Han (See page 2, paragraph 3).

As to claim 4, Tuzhilin as modified teaches a method for analyzing the calling pattern cube (i.e. data cube) by utilizing at least one performing OLAP operation on data cubes (See Han page 3, section 2.3).

As to claim 5, Tuzhilin as modified teaches a method for OLAP operations is one of a roll-up operation, a drill-down operation, a dice operation, a slice operation (See Han page 3, section 2.3) and an ad-hoc query (i.e. be able to browse conveniently, See Han page 3, section 2.2).

As to claim 16, Tuzhilin as modified teaches a data processing system comprising:

an analysis tool for use by a data analyst to perform one

of comparing the calling pattern cube to known fraudulent

calling pattern cube (Tuzhilin Col. 13 lines 51-52, Col. 14

lines 28-32) and extracting information from the calling pattern

cube based on selected dimensions, levels, and ad-hoc queries

provided by the data analyst (Han page 4, section 2.4, page 5

section 2.5, page 6 section 2.6) and (page 3, section 2.2).

As to claim 17, Tuzhilin as modified teaches a data

processing system comprising:

a visualization tools for use by a data analyst to display

the calling pattern cube in different formats, levels and

dimensions (See Han page 3, section 2.2, 6th paragraph).

As to claims 18 and 23, Tuzhilin as modified teaches a data

processing system comprising:

a data staging tool for transferring data between the

profile cube stored in the OLAP server and profile table in the

data warehouse at predetermined time intervals (See Han Fig 1).

As to claim 20, Tuzhilin as modified teaches a method

comprising:

utilizing an OLAP server to create a calling profile cube
(See Tuzhilin Col. 7, lines 35-67), updated calling profile
cubes (See Tuzhilin Fig. 2, and Col. 7, lines 35-67), derive
calling pattern cubes from the calling profile cube, analyzing
calling pattern cubes, and comparing calling pattern cubes (See
Tuzhilin Fig. 4 and col. 11, lines 43-52);

wherein OLAP programming supported by the OLAP server
provides a scalable computation engine for generating and
processing the calling pattern cubes (Han Fig. 1 and page 3,
section 2.2-2.3).

As to claim 22, Tuzhilin as modified teaches a method
wherein the calling profile cube is a multi-dimensional and
multi-level cube and wherein the volume-based claaing pattern
cubes are multi-dimensional and multi-level cubes (See Han page
3, section 2.3).

As to claim 24, Tuzhilin as modified teaches a method
wherein the calling profile cube (i.e. data cube) includes a
probability distribution value based on one of the probability
distribution on calls to each callee and the probability
distribution (i.e. probability distribution) on all calls (See
Han page 5, 2nd column, 2nd paragraph).

As to claim 25, Tuzhilin as modified teaches a method

wherein the dimension include a

day-of-week hierarchy, a time hierarchy, and duration

hierarchy (i.e. day_of_week)(See Tuzhilin Col. 6, lines 13-15);

profile data cube represents a plurality of customers (i.e. cust

m-dimensional space, See Tuzhilin Col. 7, lines 60-62), and the

pattern cube represents an individual customer (See Tuzhilin

Fig. 3, item 60).

Allowable subject Matter

4.   Claims 2-3, 6-13, 15 and 29-30 are objected to as being

dependent upon a rejected base claim, but would be allowable if

rewritten in independent form including all of the limitations

of the base claim and any intervening claims.

5.   The following is a statement of reasons for the indication

of allowable subject matter:

The prior art of record (Tuzhilin (U.S. Patent No.

6,236,978 B1) and Jiawei Han, ("Towards On-Line Analytical

Mining in Large Databases," ACM SIGMOD Record, 27:1, pp. 97-107,

1998) does not disclose, teach or suggest the claimed

limitations of (in combination with all other features in the

claims):

retrieving records from the call table and based thereon

generating a snapshot cube representing the records from the

call table, the snapshot cube having predetermined dimensions;

retrieving records from the profile table and based thereon

generating a profile cube representing the records from the

profile table, the profile cube having predetermined dimensions

that are the same as the dimensions of the snapshot cube;

merging the snapshot cube and the profile cube to generate an

updated profile cube and deriving a volume-based calling pattern

based on the updated profile cube, as claimed in claim 2.

The prior art of record (Tuzhilin (U.S. Patent No.

6,236,978 B1) and Jiawei Han, ("Towards On-Line Analytical

Mining in Large Databases," ACM SIGMOD Record, 27:1, pp. 97-107,

1998) does not disclose, teach or suggest the claimed

limitations of (in combination with all other features in the

claims):

flagging a particular caller with the probability based

calling pattern being analyzed as suspicious;

automatically generating an alert that specifies callers

with suspicious probability-based calling pattern;

performing further investigation on callers with suspicious

probability-based calling pattern;

cancellation of telephone services for callers with

suspicious probability-based calling pattern; and

performing other appropriate remedial actions, as claimed

in claims 3 and 29.

The prior art of record (Tuzhilin (U.S. Patent No.

6,236,978 B1) and Jiawei Han, ("Towards On-Line Analytical

Mining in Large Databases," ACM SIGMOD Record, 27:1, pp. 97-107,

1998) does not disclose, teach or suggest the claimed

limitations of (in combination with all other features in the

claims):

detecting telecommunication fraud by comparing known

fraudulent profiles to caller pattern cubes; the profile engine

further generating a profile cube from information selected from

the profile table, generating a snapshot cube, updating the

profile cube by merging the profile cube and the snapshot cube

to generate art updated profile cube, and deriving a calling

pattern cube based on the updated profile cube; wherein the

profile engine is a scalable computation engine that is

implemented by OLAP programming supported by the OLAP server, as

claimed in claim 15.

Claims 6-13 are objected to as being dependent from the

objected to dependent claim 2.

Claims 30 are objected to as being dependent from the

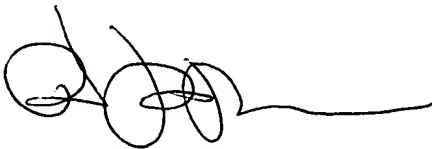objected to dependent claim 29.

Points of contact

6.   Any inquiry concerning this communication or earlier

communications from the examiner should be directed to Yicun Wu

whose telephone number is 703-305-4889.   The examiner can

normally be reached on 8:00 am to 4:30 pm, Monday -Friday.

If attempts to reach the examiner by telephone are unsuccessful,

the examiner's supervisor, Dov Popovici can be reached on 703-

305-3830.   The fax phone numbers for the organization where this

application or proceeding is assigned are 703-872-9306 for

regular communications and 703-746-7240 for After Final

communications.

     Any inquiry of a general nature or relating to the status

of this application or proceeding should be directed to the

receptionist whose telephone number is 703-305-3900.

Yicun Wu
Patent Examiner
Technology Center 2100

November 13, 2003

DOV POPOVICI
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100